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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,341	10/09/2003	Rene Paquet	2993-469US RM/JR/as	3382
32292	7590	12/03/2004	EXAMINER	
OGILVY RENAULT (PWC) 1981 MCGILL COLLEGE AVENUE SUITE 1600 MONTREAL, QC H3A 2Y3 CANADA			VERDIER, CHRISTOPHER M	
			ART UNIT	PAPER NUMBER
			3745	
DATE MAILED: 12/03/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/681,341	PAQUET ET AL.	
	Examiner Christopher Verdier	Art Unit 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-17 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 09 March 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____ .  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3-9-04</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____.                                   |

*Drawings*

The drawings are objected to because in figure 3, "32" does not point to the bearing face, but incorrectly points to the knife edge. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

*Oath/Declaration*

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:  
The specification to which the oath or declaration is directed has not been adequately identified. See MPEP § 602.

***Examiner's Suggestions to Claim Language***

The following are suggestions to improve the clarity and precision of the claims:

In claim 6, line 3, "the" (second occurrence) may be deleted.

In claim 7, line 16, -- at least one -- may be inserted after "said".

***Claim Objections***

Claim 14 is objected to because of the following informality: Appropriate correction is required.

In claim 14, line 2, "faces" should be changed to -- face --.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 5, line 3, "the knife edge extending across" is unclear if this is meant to refer to a single knife edge, or the pair of knife edges recited in line 2.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 (as far as claim 5 is definite) and 7-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Beanland 3,576,377. Note the blade in a turbine section of a gas turbine engine, the blade comprising a root 9, an airfoil 8, and a shroud 11, wherein the shroud extends generally perpendicularly from a tip the airfoil and is defined by a pair of opposed bearing faces (adjacent 17) and an unnumbered pair of opposed non-bearing faces, the bearing faces each having a contact portion 15 adapted contact a shroud of an adjacent blade, the shroud having a substantially constant nominal thickness at 11 in figure 4 and the bearing faces having a substantially constant face thickness across the contact portion, the face thickness being greater than the nominal thickness, the transition between the face thickness and nominal thickness being substantially discontinuous, with the shroud being generally planar, the bearing faces being generally planar, and the contact portions are generally at an angle from a plane perpendicular to the airfoil, with a pair of knife edges (19 and the rightmost knife edge in figure 4) extending from the shroud, the knife edges extending across an outer surface of the shroud from one bearing face to the other. The airfoil extends from the root to the tip, and the shroud extends laterally from the airfoil portion, with the shroud having a body portion 11 with a substantially constant thickness, with the body portion being generally planar, with substantially all of the contact portion having the increased surface area associated with the increased thickness, with the increased surface area inherently lowering contact stresses arising from contact with at least one mating bearing face of adjacent turbine blades. The shroud extends substantially rigidly from the airfoil portion. The recitation in line 1 of claims 1-5 of "a one-piece blade" has not been

given weight because it is recited in the preamble of the claims, and the body of the claims following the preamble is a self-contained description of the structure and does not depend on the preamble for completeness. *Kropa v. Robie*, 88 USPQ at 480-481; *Rowe*, 42 USPQ2d at 1553; and *IMS Technology Inc. v. Haas Automation Inc.*, 54 USPQ2d 1129, 1137 (Fed. Cir. 2000).

Claims 1-6 (as far as claim 5 is definite) and 7-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Erdmann 5,083,903. Note the blade in a turbine section of a gas turbine engine, the blade comprising a root near 12, an airfoil 14, and a shroud 16, wherein the shroud extends generally perpendicularly from a tip the airfoil and is defined by a pair of opposed bearing faces 18, 20 and an unnumbered pair of opposed non-bearing faces, the bearing faces each having a contact portion near 18, 20 adapted contact a shroud of an adjacent blade, the shroud having a substantially constant nominal thickness and the bearing faces having a substantially constant face thickness across the contact portion, the face thickness being greater than the nominal thickness, the transition between the face thickness and nominal thickness being substantially discontinuous, with the shroud being generally planar, the bearing faces being generally planar, and the contact portions are generally at an angle from a plane perpendicular to the airfoil, with an unnumbered pair of knife edges extending from the shroud, the knife edges extending across an outer surface of the shroud from one bearing face to the other. The shroud is generally prismatic but for discontinuities at the opposed bearing faces and but for the knife edges. The airfoil extends from the root to the tip, and the shroud extends laterally from the airfoil portion, with the shroud having a body portion with a substantially constant thickness,

with the body portion being generally planar, with substantially all of the contact portion having the increased surface area associated with the increased thickness, with the increased surface area inherently lowering contact stresses arising from contact with at least one mating bearing face of adjacent turbine blades. The shroud extends substantially rigidly from the airfoil portion. The recitation in line 1 of claims 1-5 of "a one-piece blade" has not been given weight because it is recited in the preamble of the claims, and the body of the claims following the preamble is a self-contained description of the structure and does not depend on the preamble for completeness.

*Kropa v. Robie*, 88 USPQ at 480-481; *Rowe*, 42 USPQ2d at 1553; and *IMS Technology Inc. v. Haas Automation Inc.*, 54 USPQ2d 1129, 1137 (Fed. Cir. 2000).

Claims 1-6 (as far as claim 5 is definite) and 7-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Frost 6,164,916. Note the blade in a turbine section of a gas turbine engine, the blade comprising an unnumbered root an airfoil 22, and a shroud 20, wherein the shroud extends generally perpendicularly from a tip the airfoil and is defined by a pair of opposed bearing faces near 25 and an unnumbered pair of opposed non-bearing faces, the bearing faces each having a contact portion near 25 adapted contact a shroud of an adjacent blade, the shroud having a substantially constant nominal thickness and the bearing faces having a substantially constant face thickness across the contact portion, the face thickness being greater than the nominal thickness, the transition between the face thickness and nominal thickness being substantially discontinuous, with the shroud being generally planar, the bearing faces being generally planar, and the contact portions are generally at an angle from a plane perpendicular to the airfoil, with an unnumbered pair of knife edges extending from the shroud, the knife edges

extending across an outer surface of the shroud from one bearing face to the other. The shroud is generally prismatic but for discontinuities at the opposed bearing faces and but for the knife edges. The airfoil extends from the root to the tip, and the shroud extends laterally from the airfoil portion, with the shroud having a body portion with a substantially constant thickness, with the body portion being generally planar, with substantially all of the contact portion having the increased surface area associated with the increased thickness, with the increased surface area inherently lowering contact stresses arising from contact with at least one mating bearing face of adjacent turbine blades. The shroud extends substantially rigidly from the airfoil portion. The recitation in line 1 of claims 1-5 of "a one-piece blade" has not been given weight because it is recited in the preamble of the claims, and the body of the claims following the preamble is a self-contained description of the structure and does not depend on the preamble for completeness.

*Kropa v. Robie*, 88 USPQ at 480-481; *Rowe*, 42 USPQ2d at 1553; and *IMS Technology Inc. v. Haas Automation Inc.*, 54 USPQ2d 1129, 1137 (Fed. Cir. 2000).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Erdmann 5,083,903 or Frost 6,164,916. Erdmann and Frost disclose shrouded turbine blades substantially as claimed as set forth above, and are inherently provided with a desired shroud design for a given turbine blade, and have a local increase in the shroud nominal thickness at 18, 20, and 25, respectively, thereby increasing the area of at least one shroud contact face along the contact portion length, with the local increase being limited to a region immediately adjacent the at least one shroud contact face. However, Erdmann and Frost do not disclose determining a desired face contact stress for at least one shroud contact face of the shroud, with the local increase in area corresponding to the desired face contact stress.

It would have been obvious to a turbine designer having ordinary skill in the art to design the shroud of either Erdmann or Frost such that the local increase in area corresponds to a desired face contact stress, because the local increase in area directly influences the value of the face contact stress, and skilled turbine designers normally take into account stresses when designing turbine components, including turbine shrouds, for the purpose of designing for allowable component stress levels. Therefore, it would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to determine a desired face contact stress for at least one shroud contact face of the shroud, with the local increase in area corresponding to the desired face contact stress, for the purpose of designing for allowable component stress levels.

***Prior Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

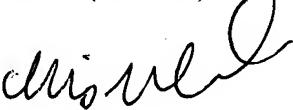
Borufka is cited to show turbine shroud with knife edges.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (703)-308-2638. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (703) 308-1044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.V.  
November 21, 2004

  
Christopher Verdier  
Primary Examiner  
Art Unit 3745